Computer Specifications

Minimum Specifications

- **CPU**: Dual-core processor with a speed of 2.5 GHz
- **Operating System**: Microsoft® Windows® 11 (64-bit)
- **RAM**: 16 GB
- **Graphics**: Support for OpenGL® 3.3 or higher, with 1GB of dedicated graphics memory
- **Hard Drive**: At least 1 GB of space for installation

Notes:

- Microsoft® Windows® 11 and Windows® Server® 2022 are supported.
- As of the 2026.0 release, Windows® 10 is no longer supported.

- As of the 2021.0 release, Microsoft® Windows® 7 is no longer supported.
- Virtual Machines are not officially supported.
- Display resolution higher than 4K is not supported.

Recommended Workstation Specifications

- **CPU**: Latest Intel® Core™ i7 or equivalent, running at 3.5GHz
- **Operating System**: Microsoft® Windows® 11 (64-bit)
- **RAM**: 64-257GB

- **Graphics**: NVIDIA® RTX™ 4000 Series with 8GB of video memory, or NVIDIA® Quadro RTX® 5000 or equivalent
- **Hard Drive**: Multiple Internal SSD (Storage, Temp, and Import)

> **Important:** Starting with 2025.0.0 version, Administrator privileges are required for installing Cyclone REGISTER 360 PLUS and Cyclone REGISTER 360 PLUS (BLK Edition) to meet new security requirements.

> **Warning:**
>
> NAS (Network Attached Storage) drives are not recommended for Cyclone REGISTER 360 PLUS project storage. Though useful for sharing and backups, they can struggle with high-performance tasks due to latency and network instability, risking data corruption or data loss.

AMD Graphics Card Support

AMD graphics cards are only partially supported in Cyclone REGISTER 360 PLUS.
General functionality within Cyclone REGISTER 360 PLUS does not require CUDA support.
However, the Classification feature specifically relies on CUDA and therefore requires a compatible NVIDIA GPU.

As a result, when using an AMD graphics card:

- All application functionality, besides Classification, will function normally.
- The Classification feature will not be available due to the lack of CUDA support.

> **Notes:**
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> - To ensure optimal performance, it is recommended to install the latest graphics card drivers from the manufacturer’s website.

- Some laptops are equipped with two graphics cards. It is important to ensure that both graphics cards are updated with the latest drivers.
- For additional performance optimisation, configure GPU usage preferences. See How to Ensure Optimal Performance of Cyclone REGISTER 360 PLUS by Setting GPU Preferences.

When Cyclone REGISTER 360 is installed on a machine that meets the recommended specifications, it can support up to **2000 Setups*** within a single Project, given that the machine has sufficient hardware resources.

*** Considerations for 2000 Setups Support**

While Cyclone REGISTER 360 is designed to support unlimited point cloud data, practical constraints exist on the number of Setups that can be processed within a single Project. Cyclone REGISTER 360 has been tested and verified to handle up to 2000 Setups. However, exceeding this limit could require substantial processing time, extensive memory, and may lead to network instability, potential data loss, and in extreme cases, corruption of the Project data.

Bundle Optimization for very large projects is a time-consuming and memory-intensive process, especially for complex and large-scale networks. This issue can be exacerbated by noisy data or poor initialization, which are often caused by significant Link and Loop Closure errors. These factors may necessitate additional iterations for optimization and could potentially cause the process to fail to converge. Therefore, the scale and complexity of the network in very large projects could surpass manageable resources and processing limits, leading to instability or data loss.

Additionally, the computation time required for rendering and displaying Link graphics between the setups can vary significantly from one project to another. Large and complex Projects with numerous Links may necessitate extended rendering time and more substantial graphics resources, potentially leading to performance issues. These

issues may vary from project to project. For example, rendering links for kinematic scanners typically takes less time compared to a tightly linked, very large bundle with high-resolution RTC360 Setups. On the other hand, WayPoint creation for kinematic data can be time-consuming.

Moreover, the process of creating and displaying the Finalized Registration can be lengthy, especially for very large projects that can also impose practical limitations on the users.

Lastly, merging multiple Projects into one with Cyclone REGISTER 360 is possible, but the practical limitations on the number of Setups remain. The same challenges may arise for processing once the number of Setups exceeds the supported threshold.

In summary, very large projects may result in networks with an unmanageable scale and complexity. Combined with noisy data, and poor initialization such complex networks may require significant computation resources, such as time for processing, Finalized Registration and Bundle Adjustment. The nominal support for 2000 Setups is for a typical Project. Exceeding this limit may lead to significant processing time, instability in the bundle network, potential data loss, and in extreme cases, corruption of the project data.

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